

Application No.: 10/648,905  
Amendment Dated: October 11, 2005  
Reply to Office Action of: August 9, 2005

MTS-3453US

**Remarks/Arguments:**

By this Amendment, Applicant has amended claim 11. Claims 15-22 have been withdrawn. Accordingly, claims 1-14 are pending.

**Claim Objections**

Claim 11 is objected to on informal grounds set forth in numbered paragraph 5 of the Office Action. Following the Examiner's guidance, Applicant has amended claim 11 to overcome the basis of the claim objection.

**Claim Rejections Under Section 102**

Claims 1, 2 and 9 stand rejected under 35 U.S.C. §102(e) as being anticipated by Cotteverte. Applicants respectfully traverse this Section 102(e) rejection.

Claim 1 is an independent claim to which claims 2-14 depend. Claim 1 is directed to a slab waveguide including the following elements:

- a two-dimensional crystal grating having columnar members having a refractive index different from the refractive index of a slab and two-dimensionally and periodically arranged along a surface of the slab,
- wherein the refractive index of the slab index portion other than the columnar members in the slab, **the number, the shape and the refractive index of the columnar members in the slab are selected so that when a beam of light entering the slab waveguide expands to a maximum extent, the size of the beam in the slab thickness direction does not exceed the slab thickness.**

It is Applicant's position that the feature of the slab waveguide of claim 1 of "the number, the shape and the refractive index of said columnar members in the slab are selected so that when a beam of light entering the slab waveguide expands to a maximum extent, the size of the beam in the slab thickness direction does not exceed the slab thickness," (hereinafter generally referred to as the "Slab Thickness Feature") is neither taught nor suggested in the Cotteverte Patent. In other words, the Slab

Thickness Feature is not found in the Cotteverte Patent, and thereby patentably distinguishes Applicant's claimed invention from the Cotteverte Patent.

The Cotteverte Patent relates in general to active photonic crystal devices for controlling an optical signal. The devices include a planar photonic crystal with a defect waveguide. In one embodiment of the invention, the propagation of the optical signal is controlled by changing a dimension of the planar photonic crystal structure. In another embodiment, the propagation of the optical signal is controlled by inserting rods into the columnar holes of the planar photonic crystal structure.

More specifically, the Office Action appears to focus on the disclosure in the Cotteverte Patent at column 8, lines 1-12 which relate to Figure 14. Figure 14 shows a planar photonic crystal device having a core layer 102, an overclad layer 104 and an underclad layer 106. The overclad layer 104 and the underclad layer 106 have refractive indexes lower than that of the core layer 102. The photonic crystal device of Figure 14 also has columns 108 disposed in square array. In addition, this photonic crystal device has a defect waveguide 110. Thus, an optical signal traveling in the defect waveguide is confined in the horizontal direction by the photonic crystal structure and in the vertical direction, by the lower refractive index cladding layers. This is in sharp contrast to Applicant's claimed invention wherein "the size of the beam of the clad thickness direction does not exceed the slab thickness" because of the selection of the "number, the shape, and the refractive index of said columnar members in the slab are selected so that when a beam of light entering the slab waveguide expands to a maximum extent." In other words, there are different parameters in the slab waveguide defined by Applicant's claim 1 controlling or confining the light in the vertical direction (i.e., the slab thickness direction) than that found in the photonic crystal device of Figure 14 in the Cotteverte Patent. The slab waveguide defined by claim 1 is shown in Applicant's Figure 1, for example.

Because the Slab Thickness Feature of Applicant's claim 1 is not found in the Cotteverte Patent, it is Applicant's contention that the Cotteverte Patent can neither anticipate nor render obvious Applicant's invention as set forth in claim 1 to which claims 2 and 9 depend. Based on the foregoing, Applicant requests that the Section 102(e) rejection be withdrawn.

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### **Claim Rejections Under Section 103**

Claims 3-8 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Cotteverte in view of Beltrami. Applicant respectfully traverses this Section 103(a) rejection.

Claims 3-8 are dependent on claim 1 and therefore include the Slab Thickness Feature of Applicant's claimed invention. As discussed above, the Cotteverte Patent neither teaches nor suggests the Slab Thickness Feature of Applicant's claimed invention. It is Applicant's position that this deficiency of the Cotteverte Patent is not rectified by the Beltrami reference.

The Beltrami Reference in general relates to the design, fabrication and characterization of a planar gradient index (GRIN) PECVD lens. The Office Action at numbered paragraph 14 described a gradient index planar waveguide structure of the Beltrami Reference in relationship to page 549 thereof. But it is Applicant's position that the Beltrami Reference neither teaches nor suggests the Slab Thickness Feature of Applicant's claimed invention and therefore does not overcome the deficiencies heretofore discussed with respect to the Cotteverte Patent.

Thus, either in combination or separately, the Cotteverte Patent and the Beltrami Reference do not anticipate or suggest the slab waveguide defined in Applicant's claim 1 to which claims 3-8 depend. Applicant's therefore request that the Section 103(a) rejection directed to claims 3-8 be withdrawn.

### **Allowable Subject Matter**

Applicant acknowledges with appreciation the Examiner's finding that dependent claims 10-14 include allowable subject matter and would be allowed if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant submits, however, that there is no need to amend claims 10-14 because they are dependent on claim 1 which is itself in condition for allowance.

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In view of the foregoing remarks and amendments, Applicant respectfully submits that claims 1-14 are in condition for allowance. Reconsideration and allowance of all pending claims are respectfully requested.

Respectfully submitted,



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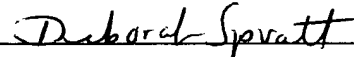
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Deborah Spratt



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